

Remarks

Claims 15-26 have been allowed. Claims 1, 7, 8, 15 and 36 have been amended, with claim 15 amended to correct grammatical errors. As a result, claims 1-5, 7-26 and 36-45 remain pending in the present application. Reconsideration of the application in view of the foregoing amendments and following comments is respectfully requested.

Claim Objection

With respect to Paragraph 3, claims 7 and 8 have been amended to remove informalities.

Claim Rejection - 35 U.S.C. § 103

With respect to Paragraph 4 of the Office Action, the Office Action rejected claims 1-5, 7, 11, 12 under 35 U.S.C. §103(a) as being unpatentable over Stengl (5,844,266) in view of Applicant's prior art in Figs. 1 and 2 and further in view of Holmes (6,316,309) and Clevenger (6,399,447). Of the rejected claims, only claim 1 is independent. Claim 1 is amended to more clearly define the invention.

Accordingly, applicants respectfully request that the rejection be withdrawn.

When applying 35 U.S.C. §103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;
- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and

(D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). (MPEP §2141)

In Fig. 1 of the Applicant's prior art (APA), the active areas are island-like (lines 2-5 on page 2 of the original specification). Therefore, the narrow distance between neighboring capacitors limit the process window of photolithography in APA when AA islands are patterned (lines 17-19 on page 2 of the original specification). However, **in amended claim 1** of the present application, the strips of active areas and shallow trench isolation regions are alternatively arranged on the substrate. The process window is no longer limited by the narrow distance between the neighboring capacitors. Moreover, this claimed feature is not disclosed by any other references. Hence, even if the references of record were to be combined, the references would not show all of the novel physical features of amended claim 1 as discussed above.

Moreover, **in Stengl and Clevenger**, the collar oxide near the shallow trench isolation (66 or 84 in Stengl and 105 in Clevenger) is shorter than the collar oxide near the active areas (15 in Stengl and 102 in Clevenger) in the depth direction of the deep trench. This is a typical cross-sectional structure of active area islands layout for DRAM cells. **In Holmes**, the collar oxides are all the same length in the depth direction of the deep trench. All of the collar oxide structures result in higher contact resistance between the buried strap and the top plate of the deep trench capacitor.

However, **in amended claim 1** of the present application, the first collar portion on an adjacent portion of two neighboring capacitors is longer than the second collar portion on the non-adjacent portion of the two neighboring capacitors in the depth direction of the deep trench, and no shallow trench isolation between the two neighboring capacitors. The collar oxide structure of amended claim 1 can reduce the contact resistance between the buried strap and the top plate of the deep trench capacitor. Therefore, it would be necessary to make modifications, not taught in the prior art, in order to combine the references in the manner suggested.

Since the references mentioned above fail to show all of the novel physical features of amended claim 1 as discussed above, and the novel features of amended claim 1 produce new and unexpected results, the claims are unobvious and patentable over these references.

Accordingly, Applicant respectfully submits that independent claim 1 as amended is allowable over the art of record and respectfully requests the 35 U.S.C. §103(a) rejection of claim 1 to be reconsidered and withdrawn. In addition, insofar as claims 2-5, 7, 11, 12 depend from independent claim 1 and add further limitations thereto, the 35 U.S.C. §103(a) rejection of these claims should be withdrawn as well.

The Office Action rejected claims 36, 37, 39, 40, 45 under 35 U.S.C. §103(a) as being unpatentable over Applicant's prior art in Figs. 1 and 2 in view Clevenger (6,399,447). Of the rejected claims, only claim 36 is independent. Claim 36 is amended to correct grammatical and typographical errors.

In amended claim 36, the first collar portion on an adjacent portion of two

neighboring capacitors is longer than the second collar portion on the non-adjacent portion of the two neighboring capacitors in the depth direction of the deep trench, and the buried strap conductive layer is on the second collar portion, the shorter one. However, in Fig. 2 of the applicant's prior art and Fig. 1 of Clevenger, the buried strap is on the longer collar oxide portion. Therefore, the combination of the Applicant's prior art and Clevenger does not meet amended claim 36.

Accordingly, Applicant respectfully submits that independent claim 36 as amended is allowable over the art of record and respectfully requests the 35 U.S.C. §103(a) rejection be reconsidered and withdrawn. In addition, insofar as claims 37, 39, 40, 45 depend from independent claim 36 and add further limitations thereto, the 35 U.S.C. §103(a) rejection of these claims should be withdrawn as well.

The Office Action rejected claim 38 under 35 U.S.C. §103(a) as being unpatentable over Applicant's prior art in Figs. 1 and 2 in view of Clevenger (6,399,447) and further in view of Holmes (6,316,309).

As discussed above with respect to amended claim 36, since amended claim 36 is patentable over the combination of the APA and Clevenger, the combination of APA, Clevenger and Holmes do not disclose all of the features of claim 38. Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

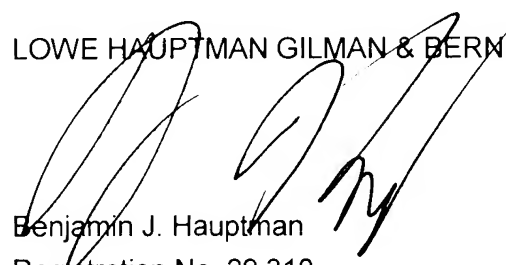
For all of the above reasons, applicants submit that the specification and claims are now in proper form, and that the claims patentably define over the prior art. All claims in the present application are now in condition for allowance. Early

and favorable indication of allowance is courteously solicited. Therefore applicants respectfully request issuance for this case at the Office Action's earliest convenience.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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